

WNV Human Case Investigation and Reporting



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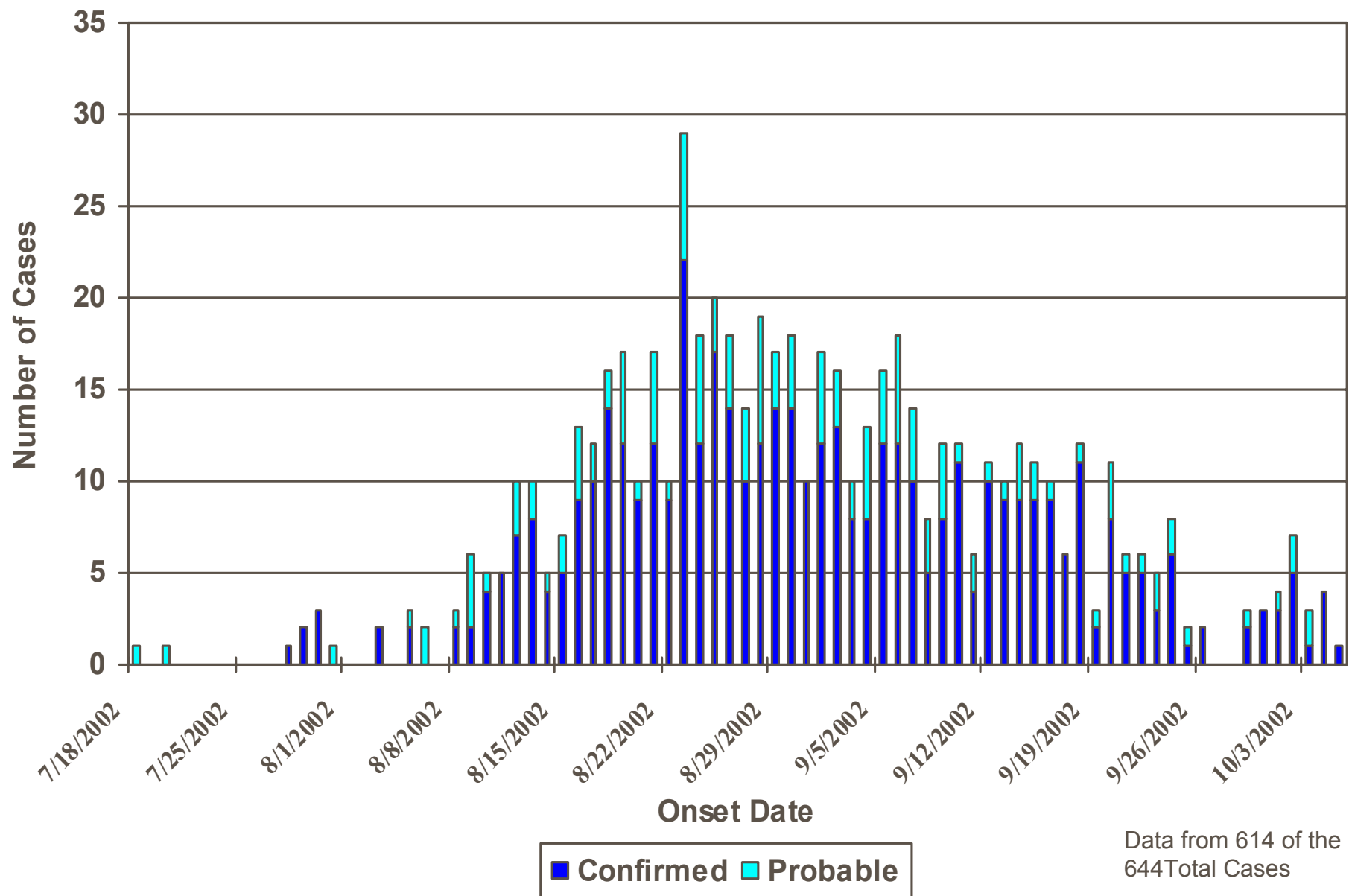
Michigan Department of Community
Health



Types of West Nile Illness

- 80% asymptomatic
- 20% have flu-like symptoms
- <1% have meningo-encephalitis/flaccid paralysis/other serious sequelae
- ~10% of those with serious CNS signs die

Onset Date of Symptoms Among Human West Nile Virus Cases in Michigan for 2002





West Nile Meningo-encephalitis

- Fever
- Headache
- Altered mental status AND/OR
- Stiff neck with CSF pleocytosis or elevated protein



West Nile Fever

- CDC-**Recommended** case definition
- Currently not nationally notifiable
- Purpose is to aid public health surveillance for certain diseases or conditions that have not been officially approved by the CSTE
- Event Code: 10049



West Nile Virus Case Summary

Total Laboratory Positive Cases: 644

West Nile Meningo-encephalitis cases: 559

Age range: .75-95 yrs

Average age: 57.8 yrs

West Nile Fever cases: 57

Age range: 3-80 yrs

Average Age: 47.7 yrs

Unknown cases: 28

Deaths: 51

Age range: 24-95 yrs

Average age: 74.5 yrs



Laboratory Diagnosis of Human Cases

- CSF is best specimen
- IgM Capture ELISA
- PRNT (measure of IgG)
- Serum-need paired sera to document a rise in titer
- SLE cross reaction-must run concurrently



Commercial Laboratory Issues

- Some will be offering ELISA tests
- Will **not** be running concurrent SLE testing
- May not be requiring **paired sera**
- **Flavivirus positive** is only possible interpretation
- **Will still require confirmatory testing at MDCH Laboratory.**



National Case Definitions:

**CSTE Developed and Approved,
CDC Adopted**

- ✓ West Nile Meningitis/Encephalitis (WNME)
- ✓ West Nile Fever (WNF)



WNME (applies to all arboviruses):

Clinical Description:

Arboviral infections may be asymptomatic or may result in illnesses of variable severity sometimes associated with central nervous system (CNS) involvement. When the CNS is affected, clinical syndromes ranging from febrile headache to aseptic meningitis to encephalitis may occur, and these are usually indistinguishable from similar syndromes caused by other viruses. **Arboviral meningitis** is characterized by fever, headache, stiff neck, and pleocytosis. **Arboviral encephalitis** is characterized by fever, headache, and altered mental status ranging from confusion to coma with or without additional signs of brain dysfunction (e.g., paresis or paralysis, cranial nerve palsies, sensory deficits, abnormal reflexes, generalized convulsions, and abnormal movements).

<http://www.cdc.gov/epo/dphsi/casedef/encephalitiscurrent.htm>



Laboratory Criteria:

- Fourfold or greater change in virus-specific serum antibody titer, or
- Isolation of virus from or demonstration of specific viral antigen or genomic sequences in tissue, blood, cerebrospinal fluid (CSF), or other body fluid, or
- Virus-specific immunoglobulin M (IgM) antibodies demonstrated in CSF by antibody-capture enzyme immunoassay (EIA), or
- Virus-specific IgM antibodies demonstrated in serum by antibody-capture EIA and confirmed by demonstration of virus-specific serum immunoglobulin G (IgG) antibodies in the same or a later specimen by another serologic assay (e.g., neutralization or hemagglutination inhibition).



Case Classification:

Probable: an encephalitis or meningitis case occurring during a period when arboviral transmission is likely, and with the following supportive serology: 1) a single or stable (less than or equal to twofold change) but elevated titer of virus-specific serum antibodies; or 2) serum IgM antibodies detected by antibody-capture EIA but with no available results of a confirmatory test for virus-specific serum IgG antibodies in the same or a later specimen.

Confirmed: an encephalitis or meningitis case that is laboratory confirmed



Caveats:

Because closely related arboviruses exhibit serologic **cross-reactivity**, positive results of serologic tests using antigens from a single arbovirus can be misleading. In some circumstances (e.g., in areas where two or more closely related arboviruses occur, or in imported arboviral disease cases), it may be epidemiologically important to attempt to pinpoint the infecting virus by conducting cross-neutralization tests using an appropriate battery of closely related viruses. This is essential, for example, in determining that antibodies detected against St. Louis encephalitis virus are not the result of an infection with West Nile (or dengue) virus, or vice versa, in areas where both of these viruses occur.

The seasonality of arboviral transmission is variable and depends on the geographic location of exposure, the specific cycles of viral transmission, and local climatic conditions. **Reporting should be etiology-specific.**



Case Definition/WNF

Case Description:

A non-specific, self-limited, febrile illness caused by infection with West Nile virus, a mosquito-borne flavivirus. Clinical disease generally occurs 2-6 days (range, 2-15 days) following the bite of an infected mosquito. Typical cases are characterized by the acute onset of fever, headache, arthralgias, myalgias, and fatigue. Maculopapular rash and lymphadenopathy generally are observed in less than 20% of cases. Illness typically lasts 2-7 days.



Case Classification:

Probable: a clinically compatible illness plus: case occurring during a period when arboviral transmission is likely, and with the following supportive serology: 1) a single or stable (less than or equal to twofold change) but elevated titer of virus-specific serum antibodies; or 2) serum IgM antibodies detected by antibody-capture EIA but with no available results of a confirmatory test for virus-specific serum IgG antibodies in the same or a later specimen.

Confirmed: a clinically compatible illness that is laboratory confirmed



Caveats:

Same as for WNME Plus:

Because dengue fever and West Nile fever can be clinically indistinguishable, the importance of a **recent travel history** and appropriate serologic testing cannot be overemphasized. In some persons, West Nile virus specific IgM antibody can wane slowly, and be detectable for more than one year following infection. Therefore, **in areas where West Nile Virus has circulated in the recent past, the co-existence of West Nile virus-specific IgM antibody and illness in a given case may be coincidental and unrelated. In those areas, the testing of serially collected serum specimens assumes added importance.**



CASE INVESTIGATION AND REPORTING



Public Health Code

- R 325.173

Details the reporting requirements for health care providers, health care facilities, and clinical laboratories

- R 325.174

Gives local and state public health officials the authority to investigate possible cases of illness reported to them

Encephalitis, viral

Meningitis, viral

Unusual occurrence,
outbreak, or epidemic
of any disease

Michigan Department of Community Health

PHYSICIAN - DISEASE REPORTING

All Michigan physicians and health care providers are required¹ to report patients with the following conditions to the local health department. To assist health care providers in meeting their obligations to report, the Michigan Department of Community of Health has prepared the list presented below. Lab-confirmed and clinical diagnosis are reportable in the time intervals listed. Reporting allows for appropriate public health follow-up for your patients and assists us in identifying outbreaks not always evident to a sole provider.

Local Health Dept. Phone: () Contact Name: _____



IMMEDIATELY

Any unusual occurrence, outbreak, or epidemic of any disease, condition, and/or nosocomial infection.



WITHIN 24 HOURS

AIDS Anthrax Botulism Chancroid Cholera Diphtheria Gonorrhea	Granuloma inguinale <i>H. influenzae</i> (meningitis or epiglottitis) Hepatitis B in a pregnant woman Lymphogranuloma venereum Measles Meningococcal disease (meningitis or meningococcemia) Pertussis	Plague Poliomyelitis Rabies (human) Syphilis Tuberculosis Viral hemorrhagic fevers Yellow fever
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WITHIN THREE WORKING DAYS

Amebiasis Blastomycosis Brucellosis <i>Campylobacter</i> enteritis Chlamydia (genital) Coccidioidomycosis Cryptococcosis Cryptosporidiosis Cyclosporiasis Dengue fever <i>E. coli</i> disease (only shiga toxin producers) Ehrlichiosis Encephalitis, viral Giardiasis Guillain-Barré syndrome Hantavirus pulmonary syndrome Hemolytic-uremic syndrome	Hepatitis Histoplasmosis Kawasaki disease Legionellosis Leprosy Leptospirosis Listeriosis Lyme disease Malaria Meningitis (bacterial & viral) Mumps Psittacosis Q fever Reye's syndrome Rheumatic fever Rocky Mountain spotted fever Rubella (congenital syndrome)	Rubella Salmonellosis Shigellosis Staphylococcal disease, (first 28 days post-partum mother or child) Streptococcal, invasive Group A (normally sterile sites) Tetanus Toxic shock syndrome Trachoma Trichinosis Tularemia Typhoid fever Typhus <i>Yersinia</i> enteritis
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WITHIN ONE WEEK

HIV Infection	Chicken pox (aggregate numbers)	Influenza (aggregate numbers)
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HOW TO REPORT

Call, mail or fax your local health department
Provide patient demographics, diagnosis and onset date

¹ Communicable Disease Rules
R 325.171 et al

Arboviruses

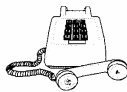
Any unusual occurrence, outbreak, or epidemic of any disease

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH

LABORATORY - DISEASE REPORTING

All Michigan laboratories are required¹ to report patients with the following conditions to the local health department. To assist health care providers in meeting their obligations to report, the Michigan Department of Community of Health has prepared the list presented below. Reporting allows for appropriate public health follow-up for your patients and assists us in identifying outbreaks not always evident to a sole provider.

Local Health Dept. Phone: () Contact Name: _____



IMMEDIATELY

Any unusual nosocomial infection.

occurrence, outbreak, or epidemic of any disease, condition, and/or



WITHIN 24 HOURS

<i>Bacillus anthracis</i> <i>Bordetella pertussis</i> <i>Calymmatobacterium granulomatis</i> <i>Clostridium botulinum</i> <i>Corynebacterium diphtheriae</i> <i>Haemophilus ducreyi</i> <i>Haemophilus influenzae</i> type b (sterile sites)	Hemorrhagic fever viruses Hepatitis B surface antigen Measles (Rubeola) virus <i>Mycobacterium tuberculosis</i> <i>Neisseria gonorrhoeae</i> <i>Neisseria meningitidis</i> (sterile sites) Poliovirus	Rabies virus <i>Treponema pallidum</i> <i>Vibrio cholerae</i> , serovar 01 Yellow fever virus <i>Yersinia pestis</i>
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WITHIN THREE WORKING DAYS

Arboviruses <i>Borrelia burgdorferi</i> <i>Brucella</i> species <i>Campylobacter jejuni</i> <i>Chlamydia</i> species <i>Cryptosporidium</i> species <i>Cyclospora</i> species <i>Entamoeba histolytica</i>	<i>Francisella tularensis</i> <i>Giardia lamblia</i> Hantavirus Hepatitis A (anti-HAV IgM) Influenza virus <i>Legionella</i> species <i>Listeria monocytogenes</i> Mumps virus	<i>Plasmodium</i> species Rubella virus <i>Salmonella</i> species Shiga toxin producing <i>E. coli</i> disease <i>Shigella</i> species <i>Trichinella spiralis</i> <i>Yersinia enterocolitica</i>
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¹ Communicable Disease Rules
R 325.171 et al

HOW TO REPORT
 Call, mail or fax your local health department
 Provide patient demographics, diagnosis and onset date



Steps in Case Investigation

- Determine meaning of test result using specimen type (CSF/serum), lab result (presumptive positive, equivocal, negative), and testing algorithm.
- If probable or confirmed case, investigate.
- **First contact should be physician or hospital ICP, depending on circumstances.**



WNV Case Report Form

Key information:

•Specify arbovirus type

•Demographics

•Physician info

•Onset date

•Clinical syndrome

•CSF results

•Lab testing

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH
Communicable Disease and Immunization Division
VIRAL CNS INFECTION CASE INVESTIGATION
(Please check appropriate illness)

___ Paralytic Polio ___ Aseptic Meningitis **Identify if Outbreak Related:** _____
___ Encephalitis or ___ Arbovirus Encephalitis
Meningoencephalitis

*Note: If **polio** suspected, call MDCH for further guidance immediately.*

CASE IDENTIFYING INFORMATION				
Name: _____	Age or Birth date: _____	Sex: _____	Race: _____	
Address: _____			Home phone: _____	
(Street)	(City)	(County)	Work phone: _____	
Occupation: _____		Place of Employment: _____ (If infant or student, list school or day care)		
Attending Physician: _____		Address & Phone: _____		
Patient Hospitalized: Y or N		Hospital: _____		
(Admission date) _____		(Discharge date) _____		(City) _____
Survived: Yes or NO				

DATE OF SYMPTOM ONSET: _____

CLINICAL INFORMATION FROM ATTENDING PHYSICIAN: (Circle all that apply)

Fever ___ Confusion/memory loss Upper respiratory symptoms
Headache Sensory abnormalities Rash
Stiff neck/back Convulsion/tremor Herpes sores (within 1 month)
Lethargy/somnolence Photophobia Stupor/coma

Muscle weakness/paralysis (what muscles?) _____

Other symptoms: _____

Lumbar puncture/CSF examination: **Y or N**

If yes: CSF white blood count: _____ Differential: _____
Other CSF results: Glucose _____ Protein _____ Bacterial antigens _____
If NO, how was diagnosis made: _____

Other relevant clinical information: _____

Virology (if obtained)	Acute Serum	Convalescent serum	Feces	CSF
Date Spec. Obtained				
Lab Testing Spec. & Test Type				
Results				

Key questions:

•Travel

•Exposure to biting insects

•Organ Donation/Blood
Transfusion

•Pregnant/nursing

•Hx flavivirus vaccine

EPIDEMIOLOGY (Obtain from families)

Within **one month** of the onset of symptoms in the patient : (please circle the appropriate response)

- | | | |
|---|-----|----|
| 1) Does the patient know of anyone else with a similar illness? | Yes | No |
| 2) Was the patient exposed to anyone with a respiratory, gastro-intestinal or rash illness? | Yes | No |
| 3) Did the patient travel outside the country? | Yes | No |
| 4) Was there heavy exposure(s) to biting insects? | Yes | No |
| 5) Has the patient received an organ donation/blood transfusion? | Yes | No |
| 5) Is the patient pregnant or nursing? | Yes | No |
| 6) Has the patient ever received a vaccination for a flavivirus
(Japanese encephalitis or Yellow Fever)? | Yes | No |

For any yes answers to the questions above, provide all relevant details (including names, addresses, phone numbers, places, dates, etc.) In the space below or on a separate page to be attached.

Name	Address	Phone #	Date	Places	Other Comments

Home drinking water:	well	city	Other
Home sewage system:	septic tank	city	Other



HIPAA Rules

- The Health Insurance Portability and Accountability Act of 1996 (HIPAA)
- <http://www.hhs.gov/ocr/hipaa>
- **Expressly permits PHI to be shared for specified public health purposes without individual authorization**
- 45CFR § 164.512(b)

Case Reporting Flow:

Laboratory or Health Care Provider



Local Health Department

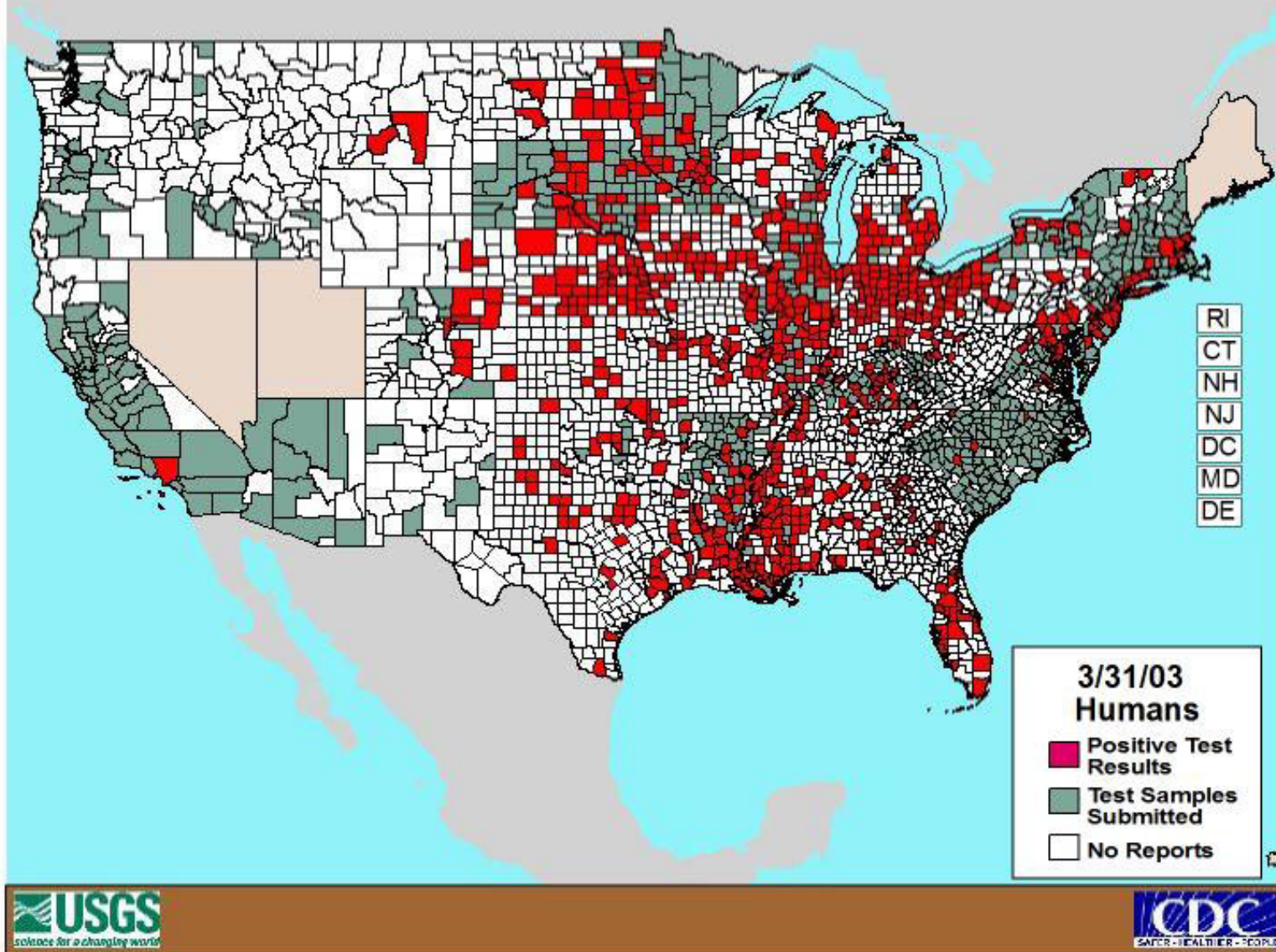


State Health Department



CDC

Human WNV Cases, 2002





www.michigan.gov/westnilevirus

Information For Health Care Providers